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DEPARTMENT OF THE ARMY TECHNICAL MANUAL

PROCEDURES FOR DESTRUCTION OF EQUIPMENT TO PREVENT ENEMY USE

(MOBILITY EQUIPMENT COMMAND)

HEADQUARTERS, DEPARTMENT OF THE ARMY
SEPTEMBER 1969

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READEX FICHE best copy available

WARNING

1. Do not attempt to demolish a piece of equipment by mechanical means while the equipment is operating.

2. Make sure all air pressure and acetylene gas are released before demolition of acetylene gas producing plant.

3. Much care will be exercised when destroying industrial gas cylinders because of the pressure and the flammability of gases contained in the cylinders.

4. Do not use gasoline, benezene, naptha, or other hydrocarbons that may build up explosive vapors in the interior of the Mobile Assault Bridge Transporter, unless an approved ignition device is available that will permit evacuation of personnel from the the vicinity of the transporter. Do not ignite the packing, under any circumstances, while personnel are still in the hull. Hatches will become natural flues and evacuation of personnel will be impossible.

5. Before demolition of marine equipment, have life rafts and life boats(s) in readiness to abondon ship. All hands must be accounted for and ready to abandon ship before lighting fire.

6. Strict observance of safety precautions during the demolition of rail equipment is mandatory in preventing personal injury or death to friendly personnel in or around the area.

7. Stand well clear of transportable fuel system when firing weapons at the Fuel tanks. Combustable vapors may ignite, causing an explosion.

8. Point blank firing at equipment with weapons should not be attempted unless the safety of all personnel in the area is assured.

9. Gasoline-soaked burlap rags are extremely hazardous to ignite. Use of this method of destruction should be used only as a last resort.

10. Personnel should not attempt mechanical destruction of LIVE electrical equipment.

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DEPARTMENT OF THE ARMY
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PROCEDURES FOR DESTRUCTION OF EQUIPMENT TO PREVENT ENEMY USE (MOBILITY EQUIPMENT COMMAND)

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope.

a. This manual is published to offer guidance to Commanders in the field on the destruction of USAMECOM maintained equipment to prevent enemy use.

b. Agreements of NATO and SEATO Armed Forces on the destruction of equipment are also included in this manual.

1-2. Purpose.

The purpose of this manual is to guide personnel in quick, effective, and safe means of rendering inoperative or of destroying equipment which is in imminent danger of capture by the enemy.

1-3. Reporting of Errors.

Reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028, Recommended Changes to Publications and forwarded direct to the Commanding General, U. S. Army Mobility Equipment Command, ATTN: AMSME-MPP, 4300 Goodfellow Boulevard, St. Louis, Mo. 63120.

Section II. PRELIMINARY CONSIDERATIONS

1-4. General.

Methods of destruction should achieve such damage to equipment and repair parts that it will not be possible to restore the equipment to a usable condition in the combat zone either by repair or cannibalization of parts.

1-5. Authorization.

The authority for ordering the destruction of equipment is to be vested in the divisional and higher commanders, who may delegate authority to subordinate commanders, when the situation requires it.

Section III. PRIORITIES FOR DESTRUCTION

1-6. General.

a. Priority must always be given to the destruction of classified equipment and associated documents.

b. When lack of time and/or demolition capability prevents complete destruction of equipment, priority is to be given to the destruction of essential parts, and the same parts are to be destroyed on all like equipment.

c. A guide to priorities for destruction of repair parts for various groups of equipment is contained herein.

1-7. Equipment Installed in Vehicles.

Equipment installed in vehicles should be destroyed in accordance with priorities for the equipment, taking into account the relative importance of the installed equipment and the vehicle in which the equipment is installed.

1-8. Repair Parts

The same priority for destruction of repair parts of a major item necessary to render that item inoperable must be given to the destruction of similar repair parts in storage areas.

1-9. Cryptographic Equipment and Material

The detailed destruction procedure to be followed in order to ensure the rapid and effective destruction of all types of cryptographic equipment and material is to be specified in instructions issued by the appropriate communication security authority.

1–10. Priorities for Destruction of Parts of Military Technical Equipment.

Equipment	Priority	Parts
Vehicles (Including Engineer Equipment)	1	Carburetor, fuel pump, injector, distributor
	2	Engine block and cooling system
	3	Tires, tracks and suspensions
	4	Mechanical or hydraulic systems (where applicable)
	5	Differentials
	6	Frame
Optical Equipment	1	Optical parts
	2	Mechanical Components
Radio	1	Transmitters (Ocillators and frequency generators)
	2	Receiver
	3	Remote control units or switchboards (exchanges) and operating terminals
Refrigeration Units and Air Conditioners	1	Compressor and electric motors
	2	Evaporator and Condensor
	3	Valves, lines, etc.

1–11. Degree of Damage.

Methods of destruction should acnieve such damage to equipment and essential spare parts that it will not be possible to restore the equipment to a usable condition in the combat zone either by repair or cannibalization.

1–12. Classified Equipment and Documents.

a. Classified Equipment. Classified equipment must be destroyed to such a degree as to prevent duplication by, or revealing means of operation or function to the enemy.

b. Associated Classified Documents. Any Classified documents, notes, instructions, or other written material pertaining to function, operation, maintenance, or employment, including drawings or repair parts lists, must be destroyed in a manner to render them useless to the enemy.

CHAPTER 2

METHODS OF DESTRUCTION

2–1. Self-Destruction Devices.

Built-in self-destruction devices should be set off even if the major item containing equipment with self-destruction devices is to be destroyed. These devices should be permitted to do their work at least partially before incendiaries or explosives (especially the latter) are set off, because an explosion might blow parts or classified documents to safety where the enemy might find them.

2–2. Improper Operation.

Improper operation of equipment will depend on the specific type of equipment to be destroyed. Improper operation of equipment include deflating tires and running equipment against an object. Pouring sand and gravel into engine crankcase, draining lubricating oil from crankcase, cutting fan belts, draining coolant from cooling system and then running equipment at full throttle, cutting hydraulic hose lines and damaging valves which are important to mechanical functions, are but a few ways to destroy equipment by misuse.

2–3. Fire.

Use fire to destroy equipment when quantities of fuel and flammable materials are at hand. Burn assemblies and components on a priority basis, if possible, as outlined in paragraph 1–10 above. Proper concentration of equipment to be burned will produce a hotter, more destructive fire. Fires should be lit after mechanical destruction has been accomplished. Fires can be built to produce more heat or more smoke. For destruction, heat is desired but smoke may be useful.

NOTE

An explosion may put out a fire.

2–4. Gunfire

Fire on equipment with the heaviest weapons available, aiming at the major assemblies and controls. Although one well placed direct hit may render the equipment inoperative, several hits may be required for complete destruction of all components.

WARNING

Point blank firing at equipment with weapons should not be attempted unless the safety of all personnel in the area is assured.

2–5. Demolition.

Refer to FM 5–25, Explosives and Demolitions, as a guide in the use, calculation of size of charges, and placement of explosives. Specific use of explosives on individual commodity groups is covered in Chapters 3 through 6 below.

NOTE

Placement of demolition charge can be the difference between minor damage or complete destruction.

2–6. Mechanical Destruction.

Using an axe, pick, mattock, sledge, or any other heavy implement, damage all vital elements such as controls, water or fuel pumps, cooling systems, switches and valves, electric motors and any other major assemblies and components.

2–7. Use of Natural Surroundings.

a. Submergence of equipment and repair parts underwater (lakes, ponds, bogs, swamps, etc.) or by concealment by hiding material in caves or, preferably by burial, can be used effectively.

b. Widely dispersed scattering of material, preferably into heavy underbrush, can serve as a denial or delaying measure. In the event the area is recaptured, effort should be made to recoup concealed items.

CHAPTER 3

SPECIAL INSTRUCTIONS

FOR CONSTRUCTION EQUIPMENT

3–1. General.

Chapters 3 through 6 are subdivided by commodities (like or similar pieces of equipment) as managed by USAMECOM. Each section in these chapters give guidance on the destruction of equipment using a representative piece(s) of equipment for the whole commodity group. All the methods discussed in Chapter 2 above can be employed to destroy or demolish a piece of equipment. However, in Chapters 3 through 6 below only the recommended methods are presented.

3–2. Training.

All operators of MECOM managed equipment should receive thorough training in the destruction of their assigned equipment. Refer to FM 5–25. Simulated destruction, using the methods in Chapter 2 above and the methods in Chapter 3 through 6 below, should be included in the operator training program. It must be emphasized in training, that demolition operations usually are necessitated by critical situations when time available for carrying out destruction is limited. For this reason, it is necessary that the operators be thoroughly familiar with all methods of destruction of equipment, and be able to carry out demolition instructions without reference to this or any other manual.

Section II. CONSTRUCTION EQUIPMENT

3–3. General.

The full-tracked tractor and the wheel tractor have been selected to typify this group of equipment.

3–4. Demolition of Tracked Tractor.

Place as many of the following charges as the situation permits and detonate them simultaneously with detonator cord and suitable detonator.

a. Two ½-pound charges on fuel injector pump.

b. Two 1-pound charges on engine block.

c. Two ½-pound charges on back of moldboard.

d. Two 1-pound charges between tracks.

e. Two 1-pound charges on transmission.

f. One 1-pound charge on starting engine.

g. One 1-pound charge on hydraulic control unit.

3–5. Destruction of Wheeled Tractor.

a. Mechanical Destruction. Using paragraph 2–6 as a guide to mechanical destruction, destroy the wheeled tractor assemblies and/or components in the following order:

(1) Air cleaner, turbocharger, and manifolds.

(2) Hydraulic tank, filters, lines, and valves.

(3) Operating control levers.

(4) Steering cylinders, bulldozer cylinders, batteries, starter, generator, drive belts, coolant pump, and radiator.

(5) Fuel tank, filters, lines and valves.

(6) Engine block and crankcase.

(7) Air tanks, lines and valves.

b. Using paragraph 2–4 as a guide to destruction by gunfire, destroy the wheeled tractor assemblies and/or components in the following order:

(1) Tires.

(2) Fuel tank, engine crankcase and air reservoirs.

(3) Hydraulic oil tank.

(4) Air cleaner and turbocharger.

(5) Radiator.

(6) Hydraulic lines at rear of cab.

3–6. Demolition of Tractor with Bulldozer.

Demolition of industrial tractor, Diesel engine driven, 4 wheel drive, 4 wheel steer, will be accomplished by placing as many of the following charges as time will allow:

(1) A 4-pound charge between fuel pump and blower housing.

(2) A 2-pound charge on lower steering column.

NOTE

The above two steps are the minimum requirement for this method.

(3) A 1-pound charge on each valve bank.

(4) A 4-pound charge behind each wheel.

(5) A 4-pound charge on the winch gear case.

(6) A 1-pound charge on the weight transfer cylinder.

(7) A ½-pound charge on the rear steering valve.

(8) A 4-pound charge under the transmission.

(9) A 4-pound charge between steering hydraulic pumps.

(10) A 2-pound charge between compressor and generator.

(11) A 4-pound charge at the left mounting bracket of the dozer moldboard.

Section III. CONSTRUCTION SUPPORT EQUIPMENT

3-7. General.

Construction support equipment includes such items as rock crushing and screening plants, drilling machines, air compressors and theodolites. There is very little correlation between items in this group of equipment, so that each one of the items has been selected to typify this group.

3-8. Rock Crushing and Screening Plant.

The rock crusher and screening plant consists of two major sections. One section is called the secondary crusher and the other section is called the primary crusher.

a. Demolition of Secondary Crusher. Place as many of the following charges as the situation permits and detonate them simultaneously using detonating cord and suitable detonator.

(1) One ½-pound charge on each cylinder head.

(2) One ½-pound charge between injector pump and engine block.

NOTE

The above charges are the minimum requirements for this method.

(3) One ½-pound charge on main (feed) conveyer motor.

(4) One ½-pound charge on vibrating screen vibrator.

(5) One ½-pound charge on rotary elevator motor.

(6) One ½-pound charge on feeder motor.

(7) One ½-pound charge on return (under) conveyer motor.

(8) One ½-pound charge on the vibrating screen motor.

(9) One 1-pound charge on the clutch housing.

(10) Six ½-pound charges between crusher rolls.

(11) Two ½-pound charges inside rotary elevator wheel.

b. Demolition of Primary Crusher. Place as many of the charges as the situation permits and detonate them simultaneously with a detonating cord and suitable detonator.

(1) One ½-pound charge between injection pump and engine block.

(2) Two ½-pound charges on engine clutch.

NOTE

The above charges are the minimum requirements for this method.

(3) One ½-pound charge on conveyor motor.

(4) Two ½-pound charges on main electric panel.

(5) One ½-pound charge on vibrating screen motor.

(6) Two ½-pound charges on axle housings.

(7) One ½-pound charge on feeder conveyor motor.

(8) Six ½-pound charges between crusher jaws.

3-9. Demolition of Drilling Machine (6 Inch Dia. Hole at 1000 Ft).

a. Mechanical Destruction.

WARNING

Before attempting any demolition by mechanical means, shut down the unit.
Use sledge hammers, crowbars, picks, axes, or other heavy tools to destroy the following:

(1) All instruments.
(2) Starter and electrical components.
(3) All oil and fuel lines and hoses.
(4) Engine.
(5) Drilling tools.
(6) Cut main drive belts and fan drive belt into several pieces.

b. Demolition by Explosives. Place as many of the following charges as the situation permits and detonate them simultaneously with detonating cord and a suitable detonator.

(1) One ½-pound charge between generator and cylinder block.

(2) One ½-pound charge between the starter and cylinder block.

(3) One ½-pound charge between the magneto and cylinder block.

(4) One ½-pound charge on each side of power takeoff.

(5) One ½-pound on each side of crankshaft.

(6) One ½-pound charge on each side of countershaft.

3–10. Demolition of Air Compressors.

Place as many of the following charges as the situation permits and detonate them simultaneously with detonating cord and suitable detonator.

a. One ½-pound charge between the compressor and the air receiver tank.

NOTE

The above step is a minimum requirement for this method.

b. One ½-pound charge between the engine or motor and the air receiver tank.

3–11. Demolition of Theodolites and General Surveying Equipment.

Theodolites can be destroyed by using the methods found in paragraphs 2–3, 2–4, or 2–6.

3–12. Demolition of Towed Earthmoving Scraper.

a. Mechanical Destruction. Use paragraph 2–6 and the following to demolish scraper by mechanical method.

(1) Destroy all accessories such as hydraulic cylinders, sequence valves, front truck assembly tailgate, and apron.

(2) Cut or damage hydraulic hose lines, tires, brackets, and bearing housings.

b. Demolition with Explosives. Place as many of the following charges as the situation permits and detonate them simultaneously with detonating cord and suitable detonator.

(1) Two ½-pound charges on front truck assembly.

(2) One ½-pound charge on each side of frame.

(3) Two ½-pound charges on bowl and tailgate.

(4) Two ½-pound charges on rear axle assembly.

Section IV. MATERIAL HANDLING EQUIPMENT

3–13. General.

A 10,000 pound forklift truck has been selected as a typical piece of equipment. It is assumed that instructions for the destruction of smaller pieces of equipment can be adapted from the following information.

3–14. Demolition of Material Handling Equipment.

Place as many of the following charges as the situation permits and detonate them simultaneously with detonating cord and suitable detonator.

a. One ½-pound charge between manifold and engine block.

b. One ½-pound charge between starting motor and engine block.

c. One ½-pound charge on the torque converter.

d. One ½-pound charge on the transmission.

e. One ½-pound charge on each axle housing.

f. One ½-pound charge in the boom.

g. One ½-pound charge under the instrument panel.

NOTE

The above procedures are the minimum requirements for this method.

CHAPTER 4

SPECIAL INSTRUCTIONS FOR POWER GENERATING AND INDUSTRIAL EQUIPMENT

Section I. POWER GENERATING EQUIPMENT

4–1. General.

Military standard engines are used extensively on generators managed by USAMECOM. Instructions in this section include destruction of the military standard engine.

4–2. Demolition of Generator Sets.

Mechanical destruction and explosive charges are recommended for destruction of this type of equipment.

a. Military Standard Engine. Use paragraph 2–6 for mechanical destruction and place ½-pound charges on the following for demolition with explosives.

(1) Charge located at carburetor, governor, fuel pump and flywheel area.

(2) Charge located at cylinder head and crankcase.

(3) Charge located at intake manifold and exhaust manifold.

b. Generator Set, Diesel Engine Driven. Location of points for placement of charges or mechanical destruction are:

(1) *Engine.*

(*a*) Fuel pump.

(*b*) Injector pump.

(*c*) Between cylinders and inside engine shroud.

(*d*) Between engine flywheel and generator.

(*e*) On water pump (water-cooled type).

(2) *Generator.*

(*a*) Control panel(s).

(*b*) Electrical system.

(*c*) Tubing.

(*d*) Cables and wiring.

(3) *Wheel mounted type.*

(*a*) At axle and spring junction.

(*b*) Between spring and chassis frame at mounting joint.

c. Generator Set, Gas Turbine Driven. Location of points for placement of charges or mechanical destruction are:

(1) One charge on top and one charge below the compressor section.

(2) One charge on top and one charge below the AC generator.

(3) Behind electrical or engine controls instrument panel.

Section II. INDUSTRIAL POWER EQUIPMENT

4–3. Demolition of Acetylene, Hydrogen, Nitrogen, Carbon Dioxide, Oxygen Charging Plants, and Oxygen Converter.

a. Oxygen-Nitrogen Plants. Plants can be rendered useless by puncturing a hole in the high-low pressure column.

b. Hydrogen and Carbon Dioxide Plants. Plants can be rendered useless by placing charges as follows:

(1) Four ½-pound charges by reboiler close to burner.

(2) Two ½-pound charges by the four heat exchangers.

c. Acetylene Plant. Plants can be rendered useless by placing charges and using mechanical destruction on the following:

(1) *Demolition with explosives.*

(*a*) A 2-pound charge under the acetylene motor.

(*b*) A 2-pound charge between the acetylene control unit covers.

(*c*) A 2-pound charge under the acetylene compressor.

(*d*) A 1-pound charge inside the spray cooler.

(*e*) A 1-pound charge between the spray cooler and its motor.

(*f*) A 2-pound charge on each side of the tandem axle.

(2) *Mechanical Destruction.*

WARNING

Make sure all air pressure and acetylene is released before demolition of plant.

(*a*) All gages, valves, indicators, and fittings on all control panels.

(*b*) Exposed lines, valves, fittings and gages.

(*c*) Acetylene compressor and motor.

(*d*) Acetylene generating tank and agitator motor.

(*e*) Acetone tank, pump and motor.

(*f*) Cooler and motor.

(*g*) Water pump, motor and piping.

d. Oxygen Converter. Converter can be rendered useless by placing charges on the following:

(1) One 1-pound charge by electric motor.

(2) One 1-pound charge by vaporization coils.

4–4. Demolition of Lamp Assemblies Used at Airports and Heliports.

Lamp assemblies used at airports and heliports can best be demolished by the mechanical method of destruction and referring to paragraph 2–6.

4–5. Demolition of Blowers (Inflating Radome Tent).

a. Demolition with Explosives. Blower can be rendered useless by placing charges on the following:

(1) One ½-pound charge beneath controller.

(2) One ½-pound charge beneath motor.

(3) One ½-pound charge beneath fan impeller.

b. Mechanical Destruction. Blower can be rendered useless by mechanically destroying the following:

(1) All controls.

(2) Motor.

(3) Blower wheel.

(4) Louvers.

4–6. Demolition of Industrial Gay Cylinders.

Industrial gas cylinders can be destroyed by opening valves and detonate cylinder or ignite hydrogen or acetylene gas.

WARNING

Much care will be exercised in destroying this type of equipment because of pressure and flammability of gases contained in cylinders.

4–7. Demolition of Storage Tanks for Oxygen, Argon, Nitrogen and Hydrogen.

Rifle shells fired at storage tanks will penetrate tank and render it useless.

4–8. Demolition of Common and Powered Tools.

a. Common Tools. These type of tools can be demolished by mechanically destroying them, concealing or burying them. Refer to paragraphs 2–6 and 2–7 for guidance.

d. Powered Tools. Same as paragraph *a* above. Misuse of tools or improper operation can render these type of tools useless.

4–9. Shop Sets in Vans Including Welders and Welding Sets.

a. Shop Sets. Refer to paragraph 1–7, and render equipment in van useless using the same method of destruction on the shop sets as on the van.

b. Welder and Welder Sets. Destroying the van in which a welder is housed may not be effective enough to satisfactorily destroy all the components on the welder unit.

(1) *Welders.* Use explosive charges on the welder as follows:

(*a*) One ½-pound charge below the generator assembly.

(*b*) One ½-pound charge behind the control panel.

(*c*) One ½-pound charge below the electric motor.

(2) *Welding set.* Refer to paragraph 2–6 and destroy by mechanical destruction the following:

(*a*) Welding gun assembly.

(*b*) Argon gas regulator.

(*c*) Contactor.

(*d*) Control panel assembly and controls.

(*e*) Solenoid valves.

(*f*) Hoses and cables.

CHAPTER 5

SPECIAL INSTRUCTIONS FOR SURFACE EQUIPMENT

Section I. AMPHIBIOUS EQUIPMENT

5–1. Amphibious Vessels.

a. Mechanical Destruction. Refer to paragraph 2–6, and destroy the following items:

(1) Engine block and manifolds.

(2) PT fuel pump.

(3) Transmission housings, and axle and assemblies.

(4) Hydraulic and lubrication pump.

(5) Radio equipment.

NOTE

The above steps are the minimum requirements for this method.

(6) Fuel tanks, lines and filters.

(7) Radiator, Keel cooler, and crossover pipes.

(8) Starting motor, alternator, and batteries.

(9) Junction box.

(10) Instrument panel and control console.

(11) Puncture hull and tires.

b. Demolition by Misuse. Operate engine at full throttle and perform the following procedures:

(1) Drain transfer transmission and forward-reverse transmission while in operation.

(2) Pour sand, sugar, salt or dirt in fuel tanks, crankcase, and radiator.

(3) Drain engine oil and run engine until it siezes.

NOTE

The above are the minimum requirements for this procedure.

(4) Pour sand, sugar, dirt, glass, and the like into the hydraulic reservoir and operate steering system and bilge pumps.

(5) Shift transmission rapidly from one position to another with engine at full throttle.

c. Demolition by Explosives. Refer to paragraph 2–5 and place as many of the following charges as the situation permits, and detonate.

(1) One ½-pound charge on the right side of the engine, left side of the engine and the top of each engine.

(2) One ½-pound charge on each side of the forward-reverse transmission (four ½-pound charges used on LARC LX).

(3) One ½-pound charge on each side of the transfer transmission. (Two ½-pound charges on each side of gathering boxes on LARC LX).

(4) One ½-pound charge on each end of the differential transmission (two ½-pound charges on each side of the miter boxes on LARC LX).

NOTE

The above steps are the minimum requirements for this method.

(5) One ¼-pound charge on the instrument panel.

(6) One ¼-pound charge on the control console.

(7) One ¼-pound charge on the surface of each wheel (two ½-pound charges on the surface of each wheel on LARC LX).

d. Weapons Fire. Fire on the vessel with the heaviest weapons available.

e. Scattering and Concealment. Remove all easily detached parts such as filters, water, oil and fuel lines, batteries, alternator, belts, control panel, float tank, solenoids, valves, and wiring. Scatter or bury them.

f. Burning. Break fuel lines at engine and puncture the fuel tanks and auxiliary tank. Saturate deck, cockpit, transfer transmission, and engine with gasoline, fuel oil, kerosene or other combustible and ignite.

g. Submersion. Remove bilge drain plugs and puncture hull. Remove radiator cap, oil fill caps, oil fill plugs and fuel tank caps. Open all drain valves on engine, transmission and hydraulic system. Drive vessel into deepest water available.

5–2. Demolition of Transporter (MAB).

a. Priority of Destruction. When lack of time or personnel prevents complete destruction of the transporter, the following priorities will be used in destruction of essential parts:

Priority	Part
1	Fuel Pump and fuel injectors
2	Engine block and cooling system
3	Tires and suspension system
4	Hydraulic systems and controls
5	Differentials
6	Frame
7	Radio Equipment

b. Mechanical Destruction. Use paragraph 2–6, and destroy the following:

(1) All accessories such as the blower, water pump, governor, fan assembly, starter, generator, fuel filters and hydraulic filters.

(2) Smash all castings such as the engine block on both sides, cylinder heads, flywheel housing, marine drive power takeoff, transmission, power divider, and marine drive assembly.

(3) Smash several large holes in the sides and bottom of the hull.

c. Demolition by Misuse. Perform the following steps to render the transporter inoperative.

(1) Disconnect the fuel rod from the left injector rack lever so the engine will run at top speed.

(2) Drain the radiator, crankcase, transmission and marine drive assembly.

(3) Start the engine and engage the marine drive assembly.

(4) Run the engine at maximum speed until failure occurs.

(5) Remove the fire extinguishers and render the extinguishers useless.

(6) Puncture the fuel tanks.

(7) Damage the tires.

(8) Cut the wiring harness and electrical wiring.

d. Demolition with Explosives. Place as many of the following charges as the situation permits, and detonate them simultaneously with detonating cord and a suitable detonator.

(1) Place a 2-pound charge on each side of the engine block.

(2) Place a 2-pound charge on each cylinder head.

(3) Place a 2-pound charge on each side of the transmission.

(4) Place a ½-pound charge on the radiator core.

(5) Place a 2-pound charge on each side of the upper portion of the marine assembly.

(6) Place a 4-pound charge on each planetary drive assembly.

(7) Place a 1-pound charge under each tire.

(8) Place a ½-pound charge at the bottom of each fuel tank and the hydraulic reservoir.

e. Demolition by Burning. Pack rags, clothing, or other suitable material around and under the engine, transmission, and other vital parts of the transporter. Saturate this packing with oil and diesel fuel. Arrange a wick, fuse, or other ignition device so that all personnel may be evacuated from the interior of the unit before ignition and ignite the packing. If a cutting torch is available, use it to burn through shafts or to make other vital parts unusable.

WARNING

Do not use gasoline, benzene, naptha, or other hydrocarbons that may build up explosive vapors in the interior of the transporter, unless an approved ignition device is available that will permit evacuation of personnel from the vicinity of the transporter. Do not, under any circumstances, ignite the packing while personnel are still in the hull. Hatches will become natural flues and evacuation will be impossible.

Section II. MARINE EQUIPMENT

5–3. Harbor Tugs

a. Sink and Abandon Ship.

WARNING

Have life rafts and life boat launched in readiness to abandon ship.

(1) Sink ship silently without using power. Open sea chest duplex sea strainers on both port and starboard sides, and remove strainer and covers. Open sea chest valves and the tug will fill with water and sink.

(2) Sink ship using power as follows:

(*a*) Start bilge and ballast pump and fill fore peak and aft peak ballast tank.

(*b*) Start the salvage pump. Position valves so that water will flow into bilges.

(*c*) Open fire main in engine room and leave sea chest valve open so that water will continue to flow in after engines are submerged and stopped.

b. Destruction by Fire.

(1) Open engine room ports and vents so that fire can get sufficient oxygen.

(2) Close valves and disconnect tanks on CO_2 fire flooding system.

(3) Have fuel oil day tank filled to capacity and disconnector break fuel oil line to each diesel engine. Be sure fuel is spilling in volume.

(4) Fill galley range day tank to capacity, break line and let fuel spill on deck.

(5) Splash fuel oil in pilot house and crew's quarters.

(6) Soak rags in fuel oil and ignite. Throw the ignited rags in engine room, galley, pilot house and crew's quarters making sure fuel oil is burning.

WARNING

All hands must be accounted for and ready to abandon ship before lighting fire.

(7) Ascertain fire has started, then abandon ship getting away as quickly as possible.

c. Destruction by Explosives. It is unlikely that the ship has explosives aboard. If explosives are available proceed as follows:

(1) Wedge a 1-pound charge to the fuel oil day tank.

(2) Wedge a 1-pound charge to the sea chest bulkhead on the port and starboard sides.

(3) Wedge a 1-pound charge on both sides of the propulsion engine.

(4) Connect fuses.

WARNING

Life boat and life raft should be overboard and all hands ready for order to abandon ship.

(5) Light fuse, abandon ship and get away as far and as quickly as possible.

d. Destruction by Misuse and Mechanical Means.

(1) *Diesel engines.*

(*a*) Close inlet valves and open drain valves in cooling system.

(*b*) Close inlet valves to lube oil pump(s), and open all drain valves in lube oil system.

(*c*) Operate engine(s) at maximum power and speed until engine failure occurs.

(2) *Compressed air system.*

(*a*) Discharge starting air tanks.

(*b*) Open drain valves in lube oil system and operate compressor until failure occurs.

(*c*) Mechanically destroy compressed air piping and tubing.

(*d*) Mechanically demolish compressor control switches and relief valves.

(3) *Electrical system.*

(*a*) Mechanically demolish and destroy all fuses, switches, controllers, instruments, and terminal boxes.

(*b*) Mechanically demolish and destroy the commutators, slip rings, brush rigging, armatures, field windings and frames of all electrical motors and generators.

WARNING

Personnel should not attempt mechanical destruction of LIVE electrical equipment.

(*c*) Demolish batteries by short circuiting the terminals with heavy metal, or by puncturing battery cases.

(*d*) Demolish all switchboards, distribution panels and any exposed electrical cables and wires.

(4) *Storage tanks.*

(*a*) Add water to all fuel oil tanks and lube oil tanks.

(*b*) Add oil to portable water tanks.

(5) *Pumps.*

(*a*) Close all valves and operate pump(s) in dry condition until failure occurs.

(*b*) Mechanically demolish pump and driver, belts, gears, and shaft couplings.

(6) *Steering System.*

(*a*) Demolish and destroy steering console.

(*b*) Cut steering winch cables, rods, and chains.

(*c*) Demolish and destroy hydraulic pumps, cylinders and piping.

(7) *Propeller shaft.* Break water line on bearings. Loosen all packing.

(8) *Pilot house.*

(*a*) Demolish and destroy magnetic compass, gyro-compass, repeaters, and pelorus.

(*b*) Demolish and destroy all signal, communication, and navigational equipment.

(*c*) Demolish all electrical wiring, controls, and instruments.

5-4. Barges.

a. Demolition by Mechanical Means. Using paragraph 2-6, demolish accessible engine parts as follows:

(1) Engine block and manifold.
(2) Governor and water pump.
(3) Radiator, starter motor and generator.
(4) Gear reducer casing.
(5) Couplings.
(6) Pump casing.

b. Demolition by Misuse. Perform the following steps to render the vessel inoperative:

(1) Drain engine radiator and engine crankcase. Place sand, gravel, nuts, bolts, screws or broken glass in radiator opening, oil filler tube and fuel tank.

(2) Disconnect engine governor linkage.

(3) Close cargo pump suction and discharge valves.

(4) Cut fan belt and operate engine at maximum power and speed until failure occurs.

c. Demolition by Explosives.

(1) Place a 5-pound charge in each cargo tank, below water line along either chine. (Where side of hull and bottom are joined).

(2) Place a 5-pound charge in forward rake compartment, below water line along either chine.

(3) Place a 5-pound charge in the pump compartment beneath cargo pump.

(4) Place a 5-pound charge in machinery house beneath engine. If vessel is loaded, damage will be compounded by fire. If vessel is empty, a terrific explosion and complete destruction will occur. If gas free, the resultant ruptures should cause vessel to sink.

d. Demolition by Weapons Fire. Fire on the engine with the heaviest weapons available.

e. Demolition by Burning. Start burning vessel either with suitable timing device, fuse or with incendiary weapons fired into cargo spaces.

NOTE

This burning method in cargo spaces is not effective if the vessel is gas free.

5–5. Landing Craft.

Whatever method of destruction is used (discussed below), it is essential to destroy the same vital parts of all the landing craft and corresponding repair parts.

a. Demolition by Mechanical Means. Refer to paragraph 2–6, and use any heavy object at hand and destroy by breakage the following:

(1) Engine block and manifolds.
(2) Fuel pump.
(3) Transmission housing.
(4) Hydraulic and lubrication pump.

NOTE

The above steps are the minimum requirements for this method.

(5) Fuel tanks, lines and filters.

(6) Radiator, keel cooler, and crossover pipes.

(7) Starting motor, alternator, and batteries.

(8) Batteries.
(9) Instrument panel and control console.
(10) Puncture hull.

b. Demolition by Misuse. Operate engine at full throttle and perform the following procedures:

(1) Drain transfer transmission and forward-reverse transmission while in operation.

(2) Pour sand, sugar, salt or dirt in fuel tanks, crankcase and radiator.

(3) Drain engine oil while running engine.

NOTE

The above steps are the minimum requirements for this procedure.

(4) Pour sand, sugar, dirt, glass and the like into the hydraulic reservoir (air pressure tanks, where applicable) and operate steering system and bilge pumps.

c. Demolition by explosives. Place as many of the following charges as the situation permits and detonate.

(1) One ½-pound charge on the right side of the engine, left side of the engine, and at the top of the engine.

(2) One ½-pound charge on each side of the forward-reverse transmission.

(3) One ½-pound charge on each side of the transfer transmission.

(4) One ½-pound charge on each end of the differential transmission.

(5) One ¼-pound charge on the instrument panel.

(6) One ¼-pound charge on the control console.

d. Demolition by Weapons Fire. Fire on the landing craft with the heaviest weapons available.

e. Scattering and Concealment. Remove all easily detached parts such as filters, water, oil and fuel lines, batteries, alternator, belts, control panel, float tank, solenoids, valves, and wiring. Scatter or bury them.

f. Destruction by Burning. Break fuel lines at engine and puncture the fuel tanks and auxiliary tank. Saturate deck, cockpit, transfer transmission and engine with gasoline, fuel oil, kerosene or other combustible and ignite.

g. Submersion. Remove bilge drain plugs and puncture hull. Remove radiator cap, oil fill caps, oil fill plugs and fuel tank caps. Open all drain valves on engine, transmission and hydraulic system.

5–6. Outboard Motors.

a. Mechanical Destruction. Refer to paragraph 2–6 and destroy the following:

(1) All controls and propeller.

(2) Engine block and fuel tank.

NOTE

The above steps are the minimum requirements for this method.

(3) Carburetor, magneto, and water pump.

b. Destruction by Misuse. Perform the following steps to render the equipment inoperative.

(1) Run motor out of water at full throttle.

(2) Submerge motor in water.

c. Destruction by Explosives. Place as many of the following charges as the situation permits, and detonate them simultaneously with a detonating cord and a suitable detonator.

(1) Attach a ½-pound charge to power head.

(2) Attach a ½-pound charge to motor leg.

Section III. BRIDGES

5–7. Demolition of Scissoring-Type Span Bridge.

a. Mechanical Destruction. Use paragraph 2–6 and render the bridge useless by destroying the following:

(1) Scissors cylinder.

(2) Flexible joint assemblies.

(3) Hydraulic lines, pipes and fittings.

b. Demolition with Explosives. Place as many charges as the situation permits and detonate them simultaneously with detonating cord and suitable detonator.

(1) One ½-pound charge on each diaphram.

(2) One ½-pound charge on three of the swivel joint pins.

5–8. Demolition of the Bailey Bridge.

a. General.

(1) To prevent use of existing bridge, cut trusses so bridge will drop into gap, and destroy abutments.

(2) To prevent reconstruction of a complete bridge, destroy bridge panels which are essential components not easily replaced or improvised.

(3) To make a panel useless, remove or distort the female lug in the lower or tension chord. Destruction of both female lugs is unnecessary.

(4) Always destroy all panels first. Other components such as transoms and decking useful to the enemy for improvised bridging should be destroyed. Components, such as stringers, ramps, jacks, rollers, and erection tools, are destroyed only if time allows and explosives are available. Because the relative importance of these components varies considerably, follow the order of destruction given in *b* below.

b. Priorities.

(1) Destroy existing bridge as described in *a* (1) above.

(2) Destroy components of existing bridge or components of stacked equipment in the following order.

(*a*) Female lug in lower chord of all panels.

(*b*) Transoms.

(*c*) Chess.

(*d*) Stringers and ramps.

(*e*) Jacks, rollers, and erection tools.

(*f*) Remaining small parts.

c. Demolition of Bridge.

(1) Cut bridge in one or more places by cutting panels on each side of the bridge and sway braces in the same bay. Stagger the line of cut through the panels. Otherwise the top chords may jam and prevent the bridge from dropping. In double- or triple-story bridges increase the charges on the chords at the junction line of the stories.

(2) For further destruction, place charges on component parts of the bridge, such as panels, transoms, and stringers. Stack and burn decking.

(3) Charges and methods of placing various explosives are given in Table I. Wedge all charges in place.

(4) Use methods and charges described in FM 5–25 for destroying abutments.

(5) Destroy panels and transoms in stacks. To dispose of stringers, ramps, jacks, rollers, small parts, and erection tools, dump them over large areas in places such as the sea, rivers, or woods. Burn decking.

(6) Methods of destruction are described in Table 2. Tamp all charges.

Table 1. Destruction of Assembled Bridge with its Component Parts

Part to be cut or destroyed	Placement of Charge	Remarks	Preferred explosive	Charge	
			United States	Individual	Total
Destruction of Assembled Bridge.					
Panel					
	Chords:				
	Between channels of chord	Preferred method: Uses less explosive. Wedging necessary. TNT blocks require excessive wedging.	Composition C4	1 lb	2 lb per panel.
	or				
	Between flanges of channels on each side of chord.	Alternate method: For TNT blocks. Use wedging.	TNT	1 lb	4 lb per panel.
	Diagonals:				
	Between flanges of channel.	Use wedging.	TNT	½ lb	1 lb per panel
			Composition C4	½ lb	1 lb per panel
Sway braces	A point where two braces cross	Tie charge to braces.	TNT	2 lb	2 lb per pair braces
			Composition C4	2 lb	2 lb per pair braces
			Tetrytol	2½ lb	2½ lb per pair braces
Destruction of Parts in Assembled Bridge.					
Panels lower-chord female lug (pinned to adjoining panel).	Between channels of lower chord behind end vertical.	Considerable wedging required with TNT blocks as they can only be inserted staggered.	TNT	1½ lb	1½ lb per lug
			Composition C4	1½ lb	1½ lb
Transoms	On web	Use wedging	TNT	1 lb	1 lb per
			Composition C4	1 lb	1 lb transom.
Stringers	On web of each I-beam	Put charge on each of the three I-beams in each stringer. Use wedging.	TNT	1 lb	3 lb per
			Composition C4	1 lb	3 lb stringer.
Chess		Remove from bridge, stack, and burn.			

5–9. Demolition of Military Floating Bridge.
The recommended method of rendering a floating bridge useless is to sink the pontons. Using heavy tools or weapons fire, puncture holes in as many pontons as possible. The use of explosive charges to sink pontons and destroy the more important bridge sections is also an effective way of destroying this type of bridge.

Table II. Destruction of Stacked Equipment

Part to be cut or destroyed	Placement of Charge	Remarks	Preferred explosive	Charge	
			United States	Individual	Total
Panels (stacked vertically or horizontally).	Between jaws of lower female lug, in alternate and end panels.	Use wedging. TNT blocks cannot be fitted between jaws.	Composition C4	1 lb	1 lb per two panels
Panels (stacked horizontally only).	Between channels of lower chord behind end vertical at female lug.	Use wedging. Considerable wedging required with TNT blocks as they can only be inserted staggered.	TNT Composition C4	1½ lb 1½ lb	1½ lb per two 1½ lb panels
Transoms (stacked side-by-side).	Across top flange on an angle. and between alternate pair of transoms at varying distances from end.	Use wedging Blow both charges simultaneously to distort transoms and cut large pieces out of webs and top flanges.	TNT Composition C4	Enough to be laid end-to-end across top flange. between 1 lb alternate transoms	Approximately 1 lb per transom. 1 lb per two transoms
Transoms (not stacked)	On web	Use wedging.	TNT Composition C4	1 lb 1 lb	1 lb per 1 lb transom
Chess		Spread out, thoroughly soak with gasoline or Diesel oil and burn. Ignite by exploding two or three strands of primacord wrapped around a can of gasoline.			
Stringers, ramps, ribands, jacks, rollers, and erection tools.		Scatter in sea, rivers, woods, or over a large area.			

Section IV. RAIL EQUIPMENT

5–10. Locomotives.

a. In general, destruction of vital parts followed by burning will be sufficient to render the locomotive useless. However, selection of the particular method of destruction depends on the facilities at hand under the existing conditions. Time is usually a critical factor to be considered.

b. It is very important to properly select a point of destruction that will cause greatest obstruction to enemy movement, and also prevent hazard to friendly troops from fragments or ricochetting projectiles which may occur incidental to the destruction by gun fire.

WARNING

Strict observance of safety precautions during the demolition of rail equipment is mandatory in preventing personal injury or death to friendly personnel in or around the area.

c. Where time does not permit the firing or

complete hand destruction, the same key part or assembly, on each locomotive abandoned, will be destroyed to prevent possible cannibalization by the enemy.

5–11. Demolition of Locomotives by Mechanical Means.

Using ax, pick, mattock, sledge, or any other heavy implement, smash all vital elements such as controls, water and fuel pumps, air compressor, generators, switches and traction motors. If time permits and a sufficiently heavy implement is available, smash the engine block and cylinder heads.

5–12. Demolition of Locomotives by Burning.

a. Remove the drain plug from the fuel tank, or puncture the tank as near the bottom as possible, collecting diesel fuel for use as outlined in *c* below.

b. Pack explosive ammunition, if available, on or about the locomotive, so it will be fully exposed to the fire and in such locations that the greatest damage will result from its detonation.

c. Pour fuel oil, or preferably gasoline over the entire locomotive. Ignite by any appropriate means. If available, use an incendiary grenade, fired from a safe distance, a burst from a flamethrower, or a combustible train of suitable length.

5–13. Demolition of Locomotives by Weapons Fire.

Fire on the locomotive with the heaviest weapons available, aiming at the engine, traction motors, generators and controls. Although one well-placed direct hit may make the equipment inoperative, several hits may be required for complete destruction of all components.

5–14. Demolition of Locomotives with Explosives.

Place as many of the following charges as the situation permits, and detonate them simultaneously with detonating cord and a suitable detonator. Set 1-pound charges at each of the following locations:

a. On traction motor armature.
b. On main generator armature.
c. Inside each wheel.
d. On fuel pump.
e. In or around engine.
f. On each side of frame.
g. In electrical cabinet.
h. In air brake equipment compartment.
i. On control stand.

5–15. Demolition of Locomotives by Misuse.

Operate engine at full throttle and perform the following:

a. Pour sand, sugar, salt, or dirt in fuel tank, crankcase, and radiators.

b. Set brakes and apply full power to electrical systems and traction motors.

c. Before setting engine at full throttle, drain radiator and the crankcase on engine and air compressor. Operate the engine until it siezes.

5–16. Rail Cars and Equipment.

Rail cars can be rendered useless by placing dynamite charges to blow off the wheels, destroy the couplers, and center sills and side frames. Cars such as the guard railway car and the ambulance railway car must have the equipment inside them destroyed in addition to those items mentioned above.

CHAPTER 6

SPECIAL INSTRUCTIONS FOR TROOP SUPPORT EQUIPMENT

Section I. FIELD EQUIPMENT

6–1. Demolition of Air Conditioners.

Misuse, mechanical method of destruction, weapons fire, or destruction with explosives can be used to destroy air conditioners.

a. Priorities for Demolition. The components destroyed should follow the following order:

(1) Evaporator coil and condenser coils.
(2) Compressor.
(3) All motor(s).
(4) Tubing.
(5) Cables and Wiring.

b. Mechanical Demolition. Refer to paragraph 2–6 and destroy the components as listed in *a* above.

c. Demolition by Misuse. The air conditioner can be rendered useless by performing the following steps:

(1) Remove the oil filler plug of the compressor assembly, and pour in sand or other abrasive material.

(2) Close the discharge valve, or pinch discharge refrigerant tubing completely shut.

(3) Remove the leads from the pressure switch and connect them together.

(4) Bend fan blade housing to prevent fan blades from turning.

(5) Operate the air conditioner till the compressor assembly fails.

d. Demolition with Explosives. Place as many ½-pound charges by the components, listed in *a* above, as the situation permits, and detonate them simultaneously with a detonating cord and suitable detonator.

e. Demolition by Weapons Fire. Fire on the air conditioner with the heaviest suitable weapons available.

6–2. Demolition of Refrigeration Equipment.

a. Electric Motor Driven.

(1) *Mechanical demolition.* Refer to paragraph 2–6 and destroy the following:

(*a*) All controls, instruments and valves.
(*b*) Compressor.
(*c*) All motors.
(*d*) Condenser.

NOTE 1

The above steps are minimum requirements for mechanical demolition. For walk-in boxes, the following additional steps are desirable:

(*e*) Walk-in doors, latches and hinges.
(*f*) Conveyor doors.
(*g*) Panels and insulation.
(*h*) Lights and switches.

NOTE 2

For Ice Cream Plants, the following additional steps are desirable:

(*i*) Freezer head door.
(*j*) Hardening cabinet door, latches and hinges.
(*k*) Hardening cabinet (puncture in several places).
(*l*) Cut all cables and wiring.

NOTE 3

For semitrailer van refrigerators the following additional steps are desirable:

(*m*) Lights, electrical receptacles, and switches, reflectors, couplings, air lines, brake chambers, king pin, and landing gear.
(*n*) Tires (Deflate tires before slashing.).

(2) *Demolition by misuse.*

(*a*) Drain the compressor crankcase of all oil. Pour sand, gravel, nuts, bolts, screws or broken glass in oil filler tube.

(*b*) Loosen compressor discharge and suction valve attaching bolts and run compressor until it fails.

(3) *Demolition with explosives.*

(a) One ½-pound charge in each section of the hardening cabinet.

(*b*) One ½-pound charge in freezer cylinder.

(*c*) One ½-pound charge on floor of cabinet between compressor and compressor motor.

(4) *Demolition with Weapons Fire.* Fire on the refrigerator equipment with the heaviest suitable weapons available.

b. Gasoline Engine Driven.

(1) *Demolition by mechanical means.* Refer to paragraph 2-6, and destroy the following items:

(*a*) Carburetor. magneto, and engine speed governor.

(*b*) Starter-generator.

(*c*) Cylinder block and manifold.

(*d*) Refer to *a*(1) for additional information.

(2) *Demolition by misuse.* The refrigeration unit can be rendered useless by performing the following:

(*a*) Pinch refrigerant discharge tubing completely shut.

(*b*) Bend fan blades so they will strike evaporator and condenser.

(*c*) Remove cap from service port of suction service valve. Allow the refrigerant to escape, and pour in sand or abrasive material. Start and operate the unit until the compressor fails.

(*d*) Remove the leads from the high pressure switch and connect them together.

NOTE

The above steps are minimum requirements for this method.

(3) *Demolition with explosives.* Place as many of the following charges as the situation permits and detonate them simultaneously with detonating cord and a suitable detonator.

(*a*) One ½-pound charge on top of engine.

(*b*) One ½-pound charge on the compressor.

(*c*) One ½-pound charge on the evaporator coil.

(*d*) One ½-pound charge between condenser coil and control box.

NOTE

The above steps are minimum requirements for demolition with explosives. For semitrailer van refrigerator, the following additional steps are also desirable.

(*e*) One 2-pound charge on the axle close to the left wheel.

(*f*) One 2-pound charge on the axle close to the right wheel.

(*g*) Destroy each tire by placing an incendiary grenade under each tire.

NOTE

The detonation of the explosive charges should be delayed until the incendiary fires are well started. This will prevent the fires from being extinguished by the blast when the charges are detonated.

6-3. Demolition of Dehydrators Desiccant Dehumidifiers.

Mechanical method, burning and submersion are methods which can be used to destroy dehumidifiers.

a. Mechanical Method. Refer to paragraph 2-6 and destroy the following:

(1) Sequence timer.
(2) Cartridges.
(3) Solenoid valves.
(4) Humidity indicator.
(5) Manifold.

NOTE

The above steps are minimum requirements for this method.

b. Demolition by Burning. Pack rags, clothing, or canvas around and under the dehydrator unit. Saturate this packing with gasoline, oil or diesel fuel and ignite.

c. Demolition by Submersion. Totally submerge the dehumidifier in a body of water to provide water damage and concealment. Salt water will damage metal parts more than will fresh water.

6-4. Demolition of Space Dehumidifiers.

Mechanical method and demolition by misuse are methods which can be used to destroy dehumidifier.

a. Mechanical Method. Refer to paragraph 2-6 and destroy the following:

(1) Evaporator coil.
(2) Motor compressor, and electrical wires.
(3) Condenser coil.

b. Demolition by Misuse. Perform the following steps to render the dehumidifier inoperative.

(1) Remove the filter from the inlet of the motor compressor and allow sand and abrasives to be drawn into the compressor while the unit is in operation.

(2) Allow water to be drawn into the motor compressor while it is operating.

6-5. Demolition of Mine Detection Set.

Mechanical method, demolition by misuse, demolition with explosives, and demolition by weapons fire can be used to destroy the mine detector set.

a. Mechanical Destruction. Refer to paragraph 2–6 and destroy the following:

(1) Amplifier assembly and controls.

(2) Search head assembly.

NOTE

The above steps are the minimum requirement for this method.

(3) Headset and cable assemblies.

(4) Batteries and spare tubes.

(5) Handle and meter assemblies.

(6) Mine detector set and carrying harness.

(7) Winter battery kit components.

b. Demolition by Misuse. Perform the following steps to render the unit inoperative:

(1) Run over the equipment with a heavy vehicle such as a truck or tank.

(2) Drop the equipment from a height onto a hard surface.

(3) Pull cable assemblies out of related components.

c. Demolition with Explosives. Place as many of the following charges as the situation permits and detonate them simultaneously with detonating cord and a suitable detonator.

(1) Place a ½-pound charge inside a compact arrangement consisting of the search head, meter, headset, handle, and amplifier assemblies.

NOTE

The above charge is the minimum requirement for this method.

(2) Place a ½-pound charge on spare tubes and batteries in the mine detector set case. Close the lid and detonate the charge.

(3) If the equipment is stored in the case, place two ½-pound charges near the amplifier assembly, search head and headset assemblies. Close the lid of the case and detonate the charge.

d. Weapons Fire. Fire on the mine detector set with the heaviest suitable weapon available.

6–6. Demolition of Delousing Equipment.

Mechanical method, demolition by misuse, demolition with explosives, burning and submersion can be used to destroy the delousing equipment.

a. Demolition by Misuse. Remove the spark plug and pour sand or other abrasive material into the opening. Replace the spark plug. Pour sand or other abrasive material into the crankcase. Run the engine at high speed until it fails.

b. Demolition with explosives. Place as many of the following charges as the situation permits and detonate them simultaneously with a detonating cord and a suitable detonator.

(1) One ½-pound charge on the right side of the engine.

(2) One ½-pound charge on the air compressor.

c. Weapons Fire. Fire on the delousing equipment with the heaviest suitable weapon available.

6–7. Demolition of Trailer Unit.

Mechanical method, demolition by misuse, demolition with explosives can be used to destroy the trailer unit.

a. Mechanical Demolition. Refer to paragraph 2–6, and destroy the following:

(1) The air reservoir.

(2) The relay valve and chamber.

(3) The shock absorbers.

(4) Wheels, tires and tubes.

NOTE

The above steps are the minimum requirements for this method.

b. Demolition with Explosives. Place as many of the following charges as the situation permits and detonate them simultaneously with detonating cord and a suitable detonator.

(1) One ½-pound charge on the landing gear.

(2) One ½-pound charge between each backplate and axle stub arm.

c. Weapons Fire. Fire on the trailer with the heaviest suitable weapon available.

6–8. Demolition of Bath and Shower Units.

Mechanical method, demolition by misuse, demolition with explosives and weapons fire can be used to destroy the bath and shower units.

a. Mechanical Demolition. Refer to paragraph 2–6, and destroy the following items:

(1) All serial numbers, manufacturers' nameplates, identification plates, and unit markings.

(2) All controls and instruments.

(3) Water heater, water pump, shower stands and generator set.

(4) Water hose assemblies and power cord cables.

b. Demolition by Misuse.

(1) Disconnect the suction hose assembly, and operate the water pump. Pour sand or gravel into the prime port of the water pump, and continue to operate the pump until it stops.

(2) Disconnect the fuel line assemblies and operate the fuel pump. Pour sand and gravel into

the prime port and continue to operate the pump until it stops.

c. Demolition with Explosives. Place one ½-pound charge for demolition under the water pump and two ½-pound charges under the water heater as the situation permits, and detonate them simultaneously with a detonating cord and a suitable detonator.

d. Weapons Fire. Fire on the bath unit as the situation permits, with the heaviest suitable weapon available.

6–9. Demolition of Food Preparation Equipment.

Mechanical method and demolition with explosives can be used to destroy food preparation equipment.

a. Bakery Plant.

(1) *Mechanical demolition.* Refer to para-2–6 and destroy the following:

(*a*) Smash as many components on the equipment as the situation will allow.

(*b*) Slash tires, electrical cables, cords, hoses, and fuel lines.

(*c*) Punch holes in water pans, water and fuel tanks, and insulated panels.

(*d*) Destroy controls, instruments, lights, and other accessories.

(*e*) If a stream is nearby, throw loose parts into the water. Bury or scatter all other parts.

(2) *Destruction with explosives.* Place explosive charges in the following areas:

(*a*) In the back of the mixer bowl.

(*b*) Beneath the divider.

(*c*) Inside the divider dough box.

(*d*) In the molder sheeting rolls.

(*e*) In the oven combustion tunnel.

(*f*) In the proofing cabinet, just above the thermostatic switch bulb.

(*g*) In the sifter machine bed.

b. Field Range Outfit, Burner Unit, and Stoves.

(1) Destroy by mechanical demolition the same parts on all similar stoves and cooking outfits to prevent enemy use through cannibalization. Be sure to obliterate all serial numbers, nameplates, and unit markings.

(2) Remove and disassemble drip valve. Burn or scatter the parts or throw them into water if a stream is located nearby.

(3) Remove burner and beat it with a sledge or rocks.

(4) Puncture stove, fuel tanks, windshield and air conditioning heater-pipe sections. If the situation permits, fire several rounds of ammunition into these parts.

(5) Crush and puncture pots and sterilizing pan.

(6) Explosive charges can be used, if available, and the size and number of charges used depends upon the size of the cooking outfit to be destroyed.

6–10. Demolition of Mobile Laundry Unit.

Refer to paragraph 2–6 and destroy the same parts of all identical assemblies to prevent enemy use by cannibalization. If thorough destruction of assemblies and parts cannot be completed, destroy most important assemblies; destroy or remove parts essential to operation of assembly which cannot easily be replaced. A guide to the specific items to be destroyed is as follows:

a. Puncture fuel tanks, engine radiator, and engine oil pan in several places.

b. Smash engine cylinder head, cylinder walls, crankcase, magneto, carburetor, governors, fan, generator exciter housing, and end bearing.

c. Smash electric motors, manual motor starters and component assembly controls and instruments. Break all valves and valve stems if possible.

d. Smash water pump, tumbler, washer, extractor, and water heater outer shells, cylinders, and basket and burner assemblies. Puncture washer lower shell and extractor in several places.

e. Cut hose, electrical cables, cords, conduits and connections, drive belts, and chains. Cut trailer tires and smash and cut valve stems.

f. Puncture and smash water pump, outer cases of component assemblies, their electric motors and switches, engine cylinder head and radiator.

g. Remove end bell cover band of generator and pour oil and gasoline into generator; pour oil and gasoline over tires, electric motors, generator control panel, gasoline engine, hose, and hose reel and ignite.

6–11. Demolition of Intrusion Devices.

Intrusion devices are used by the Army, and are classified pieces of equipment. Refer to the specific manual and paragraph 1–11*a.* above for instructions on demolition.

6–12. Demolition of Personnel Equipment and Tentage.

Equipment of this type can be destroyed by the mechanical method of destruction and by burning. For guidance on destruction, refer to paragraphs 2–3 and 2–6.

6–13. Demolition of Printing and Reproducing Equipment.

This type of equipment can be rendered inoperable by using mechanical destruction, and by misusing the equipment. Placing metal obstructions in the rollers of a printing press, and running the equipment at maximum speed is a good example of mechanical destruction.

Section II. GARRISON EQUIPMENT

6–14. Demolition of Commercial Laundry and Dry Cleaning Equipment.

This type of equipment is installed in fixed installations which are generally far removed from combat areas. If demolition instructions should ever be required, the following steps are recommended to render the equipment inoperative.

a. Commercial Laundry Equipment. Refer to paragraph 2–6 and destroy the following:

(1) Programmer and electric controls.

(2) Steam and water valves.

(3) Puncture holes in water tanks, and steam operated press chambers.

(4) Fracture or puncture main boiler.

b. Dry Cleaning Equipment. Dry cleaning equipment is similar to laundry equipment except that it does not contain a boiler unit. Destroy the items as listed in *a* above by fire (para 2–3), using the flammable dry cleaning liquids. If demolition by fire is not practical, then dry cleaning equipment should be destroyed by following the procedures in *a* above.

6–15. Demolition of Commercial Food Preparation Equipment.

Destroy items such as ranges, ovens, griddles, meat slicing machines, food grinding machines, commercial-type refrigerators, steam tables, toasters (rotating type), coffee urns, etc. by referring to paragraph 2–6 and destroying the following:

a. Smash electric motors, electrical controls, cables and wires.

b. Puncture holes in water vessels.

c. Smash evaporator coils and heat exchanging devices.

6–16. Demolition of Furniture.

Refer to paragraphs 2–3 and 2–6 and destroy wooden furniture by fire and by the mechanical method of destruction. Metal furniture can best be destroyed by the mechanical method of destruction.

6–17. Demolition of Office Equipment.

Typewriters, desk calculators, dry-type copiers, adding machines, etc. can be destroyed by the mechanical method of destruction. Refer to paragraph 2–6 for guidance on mechanical destruction.

6–18. Demolition of heating equipment.

Heating equipment can be destroyed by mechanical method of destruction and by burning. Refer to paragraphs 2–3 and 2–6 and destroy the following items.

a. Remove and smash electrical controls, control valves and burner units.

b. On fuel burning heaters, puncture fuel tanks, and spread fuel over entire unit and ignite.

6–19. Demolition of Instruments and Testing Equipment.

a. Land Navigation Equipment. Refer to paragraph 2–6 and destroy the following:

(1) Smash as many of the major components as time will allow.

(2) Cut electrical wires and unbolt and dispose of the control box.

b. Petroleum, Oil and Lubricant Test Labs. This equipment is stored and used in vans and can be destroyed by mechanical destruction, and by using the flammable compounds tested to set fires to destroy the lab equipment.

6–20. Demolition of Fire Trucks and Fire Fighting Equipment.

Mechanical destruction, destruction by misuse and demolition with explosives can be used to destroy this type of equipment.

a. Mechanical Demolition.

(1) Smash valves, tubing and gages.

(2) Cut hoses and electrical wires.

(3) Puncture water and fuel tanks.

(4) Smash as many other components as time will allow.

b. Demolition by Misuse. Pour sand, gravel, sugar or foreign matter into pumping system and run at maximum speed until pumps fail. Just running pumps without water will cause them to fail.

c. Demolition with Explosives. Place explosive charges at major components of fire truck and detonate them simultaneously.

Section III. PETROLEUM, OIL AND LUBRICANT HANDLING EQUIPMENT

6–21. Demolition of Petroleum Pumps.

a. Frame Mounted, Military Standard Engine Drive, Centrifugal Pump.

(1) *Priority for destruction.* When lack of time or personnel prevents complete destruction of the equipment, the following priority will be used in the demolition of essential parts.

(*a*) Refer to paragraph 4–2*a* for priorities on demolition of military standard engine.

(*b*) Pump case.

(*c*) Frame and chassis.

(2) *Mechanical demolition.* Refer to paragraph 2–6 and punch holes in the fuel tank and inflict severe damage to such items as the pump, carburetor, exhaust manifolds, and the engine.

(3) *Demolition by misuse.* Add sand to oil in engine base, and drop nuts and bolts into pump case. Run engine until pump fails.

(4) *Demolition by burning.* Pack rags, clothing, or canvas under or around the engine and pump. Saturate this packing with gasoline, oil, or diesel fuel and ignite.

b. Skid Mounted, Water-Cooled Gasoline Engine Driven, Centrifugal Pipeline Pump.

(1) *Priority for destruction.* When lack of time or personnel prevents complete destruction of the equipment, the following priority will be used in the demolition of essential parts.

(*a*) Engine and accessories.

(*b*) Electrical system.

(*c*) Control panel components.

(*d*) Tubing.

(*e*) Pump unit.

(2) *Mechanical demolition.* Refer to paragraph 2–6, and strike vital parts as listed in *b*(1) above until they are rendered useless.

(3) *Demolition by misuse.* Perform the following steps to render the equipment inoperative.

(*a*) Drain engine oil and drain pump unit, and run engine at full throttle until engine fails.

(*b*) Bend fan blades to prevent rotation of fan.

(*c*) Cut "V" belts to the generator and water pump. Run engine at full speed.

(4) *Demolition with explosives.* Place as many charges as time permits; place charges in vital areas such as under the engine, control box, several charges around and under the pump, under the skid or any other place that will assure complete destruction of the unit. Use a suitable detonator to blow all charges simultaneously.

6–22. Demolition of filter Separator.

a. Mechanical Demolition. Refer to paragraph 2–6, and use the tools normally included with the separator to destroy the following:

(1) Inlet coupler, outlet adapter and associated inlet and outlet flanges.

(2) Air eliminator coupler and associated threaded fitting on the top cover.

NOTE

The above procedures are the minimum requirements for this method.

(3) All lines and fittings, pressure gage, and liquid level sight gage.

(4) Discharge valve pilot assembly, drain valve, and air eliminator.

b. Demolition with Explosives. Place charges as listed below and ignite them simultaneously with detonating cord and a suitable detonator.

(1) Place one ½-pound charge inside water separator.

(2) Place one ½-pound charge under discharge valve assembly.

c. Demolition by Burning. Pack rags, clothing, or canvas under and around water separator. Saturate this packing with gasoline, oil, or diesel fuel and ignite it.

6–23. Demolition of Distillation Unit.

The distillation unit can be destroyed by a com-

bination of methods of destruction. Refer to paragraphs 2–3 thru 2–6 above for additional guidance in destroying this equipment. The following steps are recommended in destroying the distillation unit.

a. Mechanical Destruction.

(1) Smash engine carburetor, controls and as many of the essential engine parts as necessary.

(2) Puncture the distillation evaporator unit.

(3) Close the valves on the distillation exhaust system and knock off the valve stems.

b. Demolition with Explosives. Set as many explosive charges as the situation permits and detonate them simultaneously with detonating cord and suitable detonator. Place charges as follows:

(1) Engine block.

(2) Evaporator tank.

(3) Heat exchanger.

(4) Air compressor.

(5) Engine water cooler.

c. Weapons Fire. Fire on the distillation unit with the most suitable weapon available. The distillation evaporator tank, heat exchanger and piping are the most vulnerable locations.

6–24. Demolition of Collapsible Liquid Fuel Drum.

This type of equipment may be destroyed by the mechanical method or by using the fuel which the drums contain to set it on fire.

NOTE

The burning fuel-containing drums can be used to destroy other pieces of equipment in the same area.

b. Mechanical Demolition. Refer to paragraph 2–6 and use heavy tools to smash the coupler valves, the pressure control unit and to slash holes in the collapsible drum.

c. Demolition by Fire. Use some of the fuel contained in the drum to saturate the equipment and ignite.

6–25. Demolition of Lubricating and Servicing Equipment.

This equipment may be destroyed by any of the following methods, or a combination of the following methods.

a. Mechanical Demolition. Refer to paragraph 2–6 and use the tools which are normally included with the unit and destroy the following:

(1) The engine blower housing, carburetor, and flywheel.

(2) The compressor intake and exhaust valves, flywheel, air manifold, gage, unloader pilot, and valves.

(3) The engine and compressor cylinder heads.

(4) The air receiver and lubricant tanks.

b. Demolition by Misuse. Perform the steps listed below to make the unit inoperative.

(1) Drain the compressor crankcase.

(2) Throw sand or other abrasive into the crankcase.

(3) Pack the compressor cylinder head cooling vanes with grass, leaves, straw, dirt, or similar material.

(4) Start the engine, and fully open the throttle.

(5) Operate until the compressor unit fails.

(6) Cut and burn the drive belts. Apply the same procedures as outlined in paragraph *a*(1) through *a*(4) above to the engine.

c. Demolition with Explosives. Place as many of the following charges as the situation permits and detonate them simultaneously.

(1) A 1-pound charge between the engine carburetor and cylinder.

(2) A 1-pound charge on the aftercooler side of the compressor near the cylinder head, and between the low- and high-pressure cylinders.

(3) A 1-pound charge against the air receiver tank, between the tank and the hose reels.

(4) A ½-pound charge between each hose reel.

(5) A ½-pound charge on top of each lubricant pump.

d. Demolition by Weapons Fire. Fire on the lubricating unit with the heaviest suitable weapons available. Direct weapons fire at engine, fuel tank, compressor, air receiver, and lubricant pumps.

e. Demolition by Burning. Pack rags, clothing, or canvas around the engine, compressor, and hose reels. Saturate this packing with gasoline or other flammable liquid and ignite it. Remove the lids on the lubricant tanks and burn the lubricants in the tanks.

f. Submersion. Totally submerge the unit in a body of water to afford some water damage and concealment. Salt water will do the greatest damage to metal parts.

6-26. Demolition of Air Transportable Fueling Systems.

This equipment may be destroyed by any of the following methods, or a combination of the following methods.

a. Mechanical Demolition. To render the fueling system inoperative by mechanical means, the operator must use a sledge hammer or pick to destroy the engines and pumps. A sharp knife should be employed to slash the fabric tanks to shreds. Cut all hose lines in several places so that only short lengths remain.

b. Demolition with Explosives. Place charges of explosives under each fabric tank (several charges under each tank) as well as in the engine complex. Put all accessories on tanks or engine complex so as to destroy all components.

c. Demolition by Weapons Fire. Several well placed rounds of large caliber weapon fire will render the fueling system inoperative. Be sure that tanks are completely ruptured and beyond repair. For most effective destruction, use high explosive shoulder weapons (recoiless rifle, rocket launcher, etc.) or heavy artillery. Direct the fire at the engine complex and the fabric tanks. Incendiary projectiles are also recommended.

WARNING

Stand well clear of the fueling system when piercing the tanks; combustible vapors may ignite, causing a volatile explosion.

d. Other Demolition Methods. If components cannot be smashed or destroyed by other means, drain the oil from the engines and run at top speed until a breakdown occurs. Drain tanks and set the tanks afire with residue fuel.

6-27. Demolition of Petroleum Storage Equipment.

a. Demolition with Explosives. Place as many of the following charges as the situation permits and detonate them simultaneously with detonating cord and a suitable detonator.

(1) Place one 2-pound charge against the base of the tank.

(2) Place one 2-pound charge against the base of the manhole dome in the deck.

NOTE

The above steps are the minimum requirements for this method.

b. Demolition by Weapons Fire. Fire on the tank with the heaviest suitable weapons available.

c. Demolition by Burning.

(1) When time is available burn the fuel within the tank. This will serve two purposes. First, it will consume the fuel. Second, it will buckle the plates of the tank and destroy the tank seals and tank gaskets.

(2) To assure that the fuel in the tank will ignite, soak burlap with gasoline and place it six feet or more from explosive charge. Ignite the gasoline soaked burlap just after igniting the time fuse, or just before firing the charge electrically.

WARNING

Gasoline-soaked burlap rags are extremely hazardous to ignite. Use of this method of destruction should be used as a last resort.

(3) Perforate the tank in many places with armor-piercing bullets, and ignite escaping fuel with burning rags.

(4) Use incendiary grenades or bursts of 50-caliber incendiary ammunition.

CHAPTER 7

SPECIAL INSTRUCTION FOR SAFE DISPOSITION OF EQUIPMENT CONTAINING RADIOACTIVE MATERIALS

7-1. Introduction.

a. This chapter gives guidance to Commanders in the field for destroying or rendering inoperative equipment containing radioactive material, when its capture by the enemy is imminent.

b. Planning of actions to be carried out, prior to a real confrontation, is required to properly assess the magnitude of the problem, to consider the safety of U.S. Army personnel, and to react effectively in difficult situations.

c. In order to properly evaluate the above actions, it is necessary to be familiar with radiation hazards.

7-2. Radiation Hazards.

a. General

(1) The amount of radioactive material in an individual item used by the U.S. Army is usually quite small and the item has been designed to function without subjecting personnel to any serious radiation hazard. Therefore individually, compasses, luminous gages, electronic tubes and other radioactive items are relatively safe unless they are broken.

(2) Broken items, containing small amounts of radioactive material (Priority Code 2 Materials, Appendix B), present little hazard if properly handled with disposable rubber or polyethylene gloves, and disposed of in a sealed container in accordance with AR 755-15.

(3) Items containing large amounts of radioactive material (Priority Code 1 materials, Appendix B) are well marked, have good control directives, are used by trained personnel and are held under tight security. These items present the greatest radiation hazard when used in a combat zone. Presently, there are no Priority Code 1 materials managed by USAMECOM.

(4) The factors to consider in evaluating a radioactive material hazard include: the radioactive material, the kind of radiation it will emit, the quantity present, its form (gas, liquid, solid), how the material is contained or shielded, radiation effects on personnel, toxic effects, permissible limits and doses, and disposal or decontamination methods available.

(5) The Commanding Officer can receive guidance in evaluating these factors from his Radiological Protection Officer (RPO), Chemical-Biological-Radiological (CBR) teams and higher authority.

b. Radioactive Material. This is any material that spontaneously disintegrates and releases energy forming a new material or a less active material. The energy is released by the emission of one or more type of radiation, i.e. alpha particles (α), beta particles (B), gamma photons (δ), X-rays, neutrons, etc. Table 1 below shows the more common radioactive materials and the type of energy emitted.

Table 1

Radioactive Material	Energy Emitted*
Cobalt—60	B— 1%, γ—99%
Iridium—192	B—50%, γ—50%
Promethum—147	B—99%, γ— 1%
Radium—226	α—94%, γ— 6%
Thallium—204	B—100%
Tritium—3	B—100%

c. Nature of Radiation

(1) *Alpha radiation*—Alpha particles have a very high ionizing capability, but a very short range. They will not penetrate the skin, therefore have neglegible effect as external radiation. They are extremely dangerous as internal radiation.

(2) *Beta radiation*—Beta particles have greater range than alpha particles. The low energy beta emitters (Table 1) used in the U. S. Army inventory have a range of only a few feet in air. They can penetrate the skin and therefore are an external hazard.

(3) *Gamma radiation*—The gamma photons are small bundles of energy traveling at about the speed of light. They have high range and require massive shielding. Several inches of heavy metals, such as lead or several feet of concrete are required. Without this massive shielding, the radia-

tion will penetrate in all directions. On very large unshielded sources the safe distance may be greater than one mile.

* α-alpha, β-beta, γ-gamma

d. Form of Material—Radioactive Materials can be solids, liquids or gases which are normally used in protective containers. From a personnel contamination standpoint, gases are more dangerous than liquids, and liquids more dangerous than solids.

e. Quantity of Radioactive Material. The activity or quantity of radioactive material present is defined as the curie. The curie (c) is the amount of material which will give 3.7×10^{10} disintegrations per second (dps). A millicurie (mc) is one thousandth of a curie and a microcurie (uc) is one millionth of a curie. TB 750-237 lists the radioactive material and the level of activity for items in the U. S. Army inventory system. USAMECOM managed radioactive items are listed in Appendix B.

f. Dose Rates and Radiation Effects on Personnel.

(1) The rontgen (r) is the measure of the amount of X-ray or gamma radiation required to produce one electrostatic unit of charge in one cubic centimeter of air. A millirontgen is one thousandth of a rontgen. Radiation dose units are generally given in rems (rontgen equivalent man) or millirems. A rem is the quantity of ionizing radiation of any kind, than when absorbed by man will produce the same physiological effect as one rontgen of X-ray or gamma radiation. Therefore, generally speaking, the terms rontgen and rems or millirontgen and millirems are equivalent.

(2) Radiac instruments usually measure the radiation dose rate in terms of millirontgens per hour. Field personnel can use these measured values and the information in Table 2 below to determine safe dose limits. This Table gives values which are one-tenth the acceptable limit for radiation workers. These limits should be used for the general public and unmonitored U. S. Army personnel.

Table 2

Radiation Dose Limits*

Millirems	Time
0.25	hr.
300	qt. yr.
500	yr.
500 (N-18)**	life

(3) Radiation dosages should be kept as low as possible. AEC limits are set at low levels to prevent overexposures. Dosages of 500 mr/hr (millirontgens per hour) for several hours may cause radiation sickness and some disability. Higher dosages may cause death.

g. Protection from External Radiation. The following methods will aid in protecting personnel from external radiation (Refer to Chap. III, AR 700-64):

(1) *Limiting source size*—This method is considered in designing equipment. In the field, factors to consider are:

(*a*) The half life or decay cycle of the radioactive material.

(*b*) Disposal of unnecessary or spent radioactive material.

(2) *Time*—Exposure time is a safety factor that should be kept at an absolute minimum.

* Values listed in Table II are accumulative dosages and are based on 1/10 values established by the Atomic Energy Commission in Title 10, Code of the Federal Regulations for radiation workers.

** N-age of person

(3) *Distance*—Distance from the source is the most expedient and a very effective method of reducing the radiation dose. The intensity of radiation varies inversely with the square of the distance. For example, a source that has an intensity of 100 mr/hr at 1 foot, will have one-fourth or 25 mr/hr at 2 feet.

(4) *Shielding*—Shields are designed to protect personnel from large intensity sources. The more dense the shielding material, the more effective it is as a shield. For example, lead is about thirteen times as dense and as effective as a shield as water. Buildings, bunkers, foxholes, trenches, and vehicles will give some shielding protection. Shielding characteristics is a factor to consider when burying or submerging radioactive material. For additional information on shielding, refer to paragraph 7-6*c*(2) and 7-6*c*(3).

(5) *Personnel monitoring*—The three principal methods of monitoring for radiation exposures are radiac meters, film badges and dosimeters. A good radiation monitoring system will alert personnel to radiation problems and steps can be taken to reduce the hazard. AR 40-14 and SB 11-206 gives guidance on personnel monitor-

ing. If only a few dosimeters or film badges are available, monitor those persons most likely to receive a radiation dose.

(6) *Radiation marking*—Areas of high radiation intensity and all radioactive sources should be properly marked. Guidance can be obtained from Chapter II, AR 700–64.

h. Inadvertent Release of Radioactive Material and Contaminator Problems.

(1) *General.* The primary concern, when radioactive material is released, is the protection of U. S. Army personnel. Planning of actions and knowledge of hazards, prior to release will greatly enhance the proper decisions for their protection.

(2) *Emergency procedures*—Emergency procedures should be planned, rehearsed and coordinated with support organizations. Guidance in preparing these procedures can be obtained from Chapter IX, AR 700–64 and TM 3–261. Emergency procedures to be considered include:

(*a*) Evacuation of contaminated area.

(*b*) Procedures to contain the spill.

(*c*) Procedure to prevent further contamination.

1. Monitor personnel.

2. Flush contaminated skin area with water.

3. Remove and discard contaminated clothing.

4. Notify the medical officer and give proper medical attention to contaminated personnel.

5. Notify the Radiological Protection Officer.

6. Monitor the area and set up safe boundary limits.

7. Use proper protective clothing and breathing apparatus when carrying out decontamination procedures.

8. Prepare a history of the accidental release. This should include recommendations for elimination of the accidental release and improvement of emergency procedures.

(*d*) Procedures for Disposition of Equipment Containing Radioactive Materials Under Combat Conditions. Refer to paragraph 7–6 below.

7–3. Responsibilities of the Commander.

AR 700–52 defines the responsibilities of the Commander of any installation or activity that possesses or uses radioactive material. These responsibilities include:

a. Establishment of control procedures for radioactive materials.

b. Measurement and recording or radiation exposures to personnel.

c. Appointment of a Radiological Protection Officer.

7–4. Responsibilities of the Radiological Protection Officer (RPO).

AR 700-52 provides for the appointment of an RPO. His education, military training and professional experience must be commensurate with the type and hazard of the radiation sources for which he is responsible. The term "Radiological Protection Officer" is a functional title and is not intended to denote a commissioned status or a job classification within the Armed Forces. His responsibilities include:

a. Providing the Commander and personnel using radioactive material with advice and assistance in matters pertaining to radiation safety.

b. Implementing the radiation protection program.

c. Reviewing radiological operations to determine compliance with regulations and approved procedures.

d. Maintaining an accurate record of the inventory of radioactive sources possessed by the installation or activity in accordance with AR 700–52.

e. Maintaining personnel monitoring records prescribed by AR 40–14 and leak-test records as described in AR 700–63.

f. Performing radiation surveys and evaluating radiation hazards.

g. Reviewing standard radiation operating procedures and emergency procedures.

h. Investigating, evaluating and recording radiation accidents of incidents.

i. Insuring radiation detection instruments are properly calibrated and ready for use.

7–5. Radiological Decontamination.

Support from Chemical-Biological-Radiological (CBR) Teams in Decontamination. Support can be obtained by the Commander from CBR teams in carrying out decontamination operations whenever a biological or radiological hazard exists that effects the unit in carrying out its mission. FM 21–40 and Chapter 4, TM 3–220, give information for carrying out radiological decontamination procedures.

7-6. Disposition of Equipment Containing Radioactive Material.

a. General. In combat, when capture by the enemy is imminent, the responsible commander must make the decision either to destroy the equipment, render it inoperative, conceal it, evacuate it or leave it for the enemy. His decision may be based on several factors including:

(1) Impact that the capture of the equipment will have on the mission of the U. S. Army.

(2) Time available for action.

(3) Facilities or equipment available for carrying out planned disposition procedures.

(4) Combat hazard to U. S. Army personnel in carrying out the disposition procdeures.

(5) Value of the equipment to the enemy.

(6) Hazard that might be created by the radioactive material contaminating the area and its effects on friendly and/or enemy personnel.

b. Priorities.

(1) Priorities for carrying out disposition of equipment actions must be carefully evaluated and included in any prior planning. Demolition actions involving small amounts of radioactive materials used in many types of luminous gages, found on boats and amphibious vehicles, construction equipment, power generators, etc. are secondary in nature to the demolition of the major end item or piece of equipment involved. These individual end items, boats, etc., can be destroyed in combat zones using normal demolition procedures without creating a serious radiological hazard. Precautions must be taken to assure that U. S. Army personnel are not contaminated by the radioactive material.

(2) Equipment containing large amounts of radioactive material (Priority code 1 in Appendix B) and depot storage of many small items containing small amounts of radioactive material, present a more significant radiological hazard, and therefore, should have a higher priority in planning for their disposition. Appendix B lists U. S. Army MECOM managed equipment containing index number, FSN(nomenclature, radioactive material, activity, and a priority for disposition code. This priority code classifies high intensity sources as 1 (primary concern), and 2 (secondary concern). Appendix C lists USAMECOM end items using the same index numbers as used in Appendix B.

c. Disposition Methods for Equipment Containing Radioactive Material.

(1) *Evacuation.* The possibility of evacuation of equipment should always be considered to prevent its use by enemy.

(2) *Burying.*

(*a*) From a safety point of view, this technique is preferred for disposal of equipment containing radioactive material in a combat zone. This is especially true for the items containing promethium—147, thallium—204 and radium—226 listed in Appendix B.

(*b*) About 7.5 inches of earth will reduce the dose rate from the material by a factor of one-half.

(*c*) A good practice, if time will allow it, is to place the item in a container (piece of pipe, box, carrying case, etc.) for burial. Besides the extra shielding value, this will decrease the chance of the equipment being broken or contaminated with foreign material. This would be important if there were a possibility of retrieving the equipment for further use.

(*d*) The area used for burial should be recorded and the information submitted through channels.

(3) *Submersion.*

(*a*) This method may be easy to carry out and may be accomplished quickly. The radioactive material is usually protectively contained, and therefore contamination of the water supply is not likely.

(*b*) CBR teams can monitor the water supply for radioactive contamination.

(*c*) Water is only about one-half as effective as earth as a radiation shield. It takes approximately 13 inches of water to reduce the radiation dose by a factor of one-half.

(*d*) A record of the location should be made and submitted through channels.

(4) *Fire.*

(*a*) This method is NOT RECOMMENDED for equipment containing radioactive materials because it will create airborn contaminated radioactive ash. The radiation intensity of the sources involved and the protection of U. S. Army personnel must be considered.

(*b*) When low radiation intensity gages or instruments are involved, and burning of the specific piece of equipment is recommended, the radiation hazard will be insignificant.

(5) *Self-destruction devices.* This method is NOT RECOMMENDED. Self-destruct mechanisms will scatter radioactive material. The guidance of paragraph 7–4(*b*) above also applies to self-destruction devices.

(6) *Gunfire.* This method is NOT RECOMMENDED. The guidance of paragraph 7–4(*b*) above also applies to gunfire.

(7) *Mechanical destruction.* This method is NOT RECOMMENDED for equipment containing radioactive material because it may cause personnel contamination.

(8) *Rendering inoperative.* Glue or other chemicals that will set-up or harden can be used to render radioactive equipment inoperative.

d. Capture of High Intensity Radioactive Sources by the Enemy. Capture of high intensity radioactive materials by the enemy should be recorded and the records of the combat loss submitted through channels. This material could be used as a weapon by the enemy.

APPENDIX A

REFERENCES

AR 40-14	Control and Recording Procedures: Occupational Exposure to Ionizing Radiation
AR 700-52	Licensing and Control of Sources of Ionizing Radiation.
AR 700-63	Control of Radioactive Calibration and Test Items of Supply
AR 700-64	Radioactive Commodities in the DOD Supply System
AR 755-15	Disposal of Unwanted Radioactive Material
FM 5-25	Explosives and Demolitions
FM 21-40	Chemical, Biological, and Nuclear Defense
STANAG NO. 2113	North Atlantic Treaty Organization, Military Agency FDR Standardization, Standardization Agreement on Destruction of Military Technical Equipment
SEASTAG 2113	Southeast Asia Treaty Organization, Military Agency FDR Standardization, Standardization Agreement on Destruction of Military Technical Equipment
SB 11-206	Film Badge (Photo-Dosimetry) Supply and Service for Technical Radiation Exposure Control
TB 34-9-89	Symbol to denote the operational interchangeability of ammunition and demolition accessories (Short - title: NATO Symbol of Interchangeability).
TB 750-237	Identification and Handling of Radioactive Items in the Army Supply System
TM 3-220	Chemical, Biological and Radiological (CBR) Decontamination
TM 3-261	Handling and Disposal of Unwanted Radioactive Materials
TM 9-1375-200	Demolition Materials

APPENDIX B

USAMECOM MANAGED RADIOACTIVE ITEMS

Item No.	FSN	Nomenclature	Radioactive Material	Activity	Priority Code
1	4220-639-8999	Gage, Depth, Wrist	TL 204	1.6 mc	2
2	4220-910-9629	Watch Divers, Wrist	Pm 147	2.0 mc	2
3	4220-695-9270	Gage, Depth, Divers	Ra 226		2
4	6350-937-1486	Arrester, Surge, Alarm Syst.	Pm 147	30.0 mc	2
5	6605-079-0007	Compass, Magnetic, Divers	Pm 147	15.5 mc	2
6	6605-171-5287	Compass, Pocket, Unmounted	Ra 226		2
7	6605-222-1746	Compass, Magnetic, Wet Oil	Ra 226	1 uc	2
8	6605-222-1752	Compass, Magnetic, Wrist, Divers	Ra 226	15 uc	2
9	6605-222-1756	Compass, Magnetic, Unmounted	Ra 226		2
10	6605-223-7064	Compass, Magnetic, Wrist	Ra 226	1 uc	2
11	6605-237-8215	Compass, Magnetic, Unmounted	Ra 226	15 uc	2
12	6605-283-0346	Compass, Magnetic, Lensatic	Ra 226	15 uc	2
13	6605-283-0349	Compass, Magnetic, Unmounted	Ra 226	25 uc	2
14	6605-290-4111	Compass, Magnetic, Divers	Pm 147		2
15	6605-641-3573	Compass, Sun, Survivors	Ra 226	15 uc	2
16	6605-691-5675	Compass	Ra 226		2
17	6605-809-5252	Compass, Wrist	Ra 226	1 uc	2
18	6605-846-7618	Compass, Lensatic	H3	50 mc	2
19	6605-898-2087	Compass, Magnetic, Wrist	H3	25 mc	2
20	6620-066-7084	Gage, Pressure, Dial	Ra 226	0.71 uc	2
21	6620-514-5492	Gage, Pressure	Ra 226	0.31 uc	2
22	6620-530-0354	Gage, Pressure	Ra 226	15 uc	2
23	6620-568-8035	Gage, Pressure	Ra 226	1.2 uc	2
24	6620-568-8036	Indicator, Temperature	Ra 226		2
25	6620-834-4801	Gage, Pressure	Ra 226		2
26	6620-838-0689	Indicator, Temperature	Ra 226	0.56 uc	2
27	6620-845-9291	Gage, Pressure	Ra 226		2
28	6625-086-8065	Ammeter	Ra 226	0.4 uc	2
29	6625-274-4045	Voltmeter, A.C.	Ra 226	15 uc	2
30	6625-510-1840	Meter, Arbitrary Scale	Ra 226		2
31	6625-519-2149	Meter, Arbitrary Scale	Ra 226		2
32	6625-542-1404	Voltmeter	Ra 226		2
33	6625-865-6013	Ammeter	Ra 226	6 uc	2
34	6625-877-6436	Ammeter	Ra 226		2
35	6625-898-4189	Ammeter	Ra 226		2
36	6645-224-8632	Clock, Marine, Mechanical	Ra 226		2
37	6645-238-9082	Clock, Marine, Mechanical	Ra 226	10 uc	2
38	6645-276-9247	Clock, Marine, Mechanical	Ra 226		2
39	6645-303-4948	Clock, Message, Center	Ra 226	10 uc	2
40	6645-515-3447	Chronometer	Ra 226	15 uc	2
41	6645-530-1096	Clock, Alarm	Ra 226		2
42	6645-556-1746	Clock, Marine, Mechanical	Ra 226		2
43	6645-537-3273	Clock, Marine, Mechanical	Ra 226		2
44	6645-664-4664	Chronometer	Ra 226	1 uc	2
45	6645-664-4666	Chronometer	Ra 226	15 uc	2
46	6645-840-1391	Chronometer	Ra 226	15 uc	2
47	6645-892-5561	Watch, Stop	Ra 226	15 uc	2
48	6665-900-8562	Detector Set, Air			2
49	6675-232-8923	Transit	Ra 226	15 uc	2
50	6675-232-8924	Transit	Ra 226		2
51	6675-232-8925	Transit	Ra 226		2
52	6675-232-8929	Transit	Ra 226		2
53	6675-514-4011	Transit	Ra 226	15 uc	2
54	6675-514-5911	Transit	Ra 226		2

APPENDIX B—Continued

USAMECOM MANAGED RADIOACTIVE ITEMS

Item No.	FSN	Nomenclature	Radioactive Material	Activity	Priority Code
55	6675-641-3468	Transit	Ra 226		2
56	6675-641-3632	Sketching Set, Surveying	Ra 226		2
57	6675-664-4655	Transit	Ra 226	15 uc	2
58	6680-024-2276	Gage, Fuel Level	Ra 226	0.24 uc	2
59	6680-282-6165	Speedometer	Ra 226	2.54 uc	2
60	6680-508-2006	Gage, Fuel Level	Ra 226	0.24 uc	2
61	6680-514-4090	Tachometer, Mechanical	Ra 226	2.52 uc	2
62	6680-514-5489	Tachometer	Ra 226		2
63	6680-514-5494	Indicator, Liquid Quantity	Ra 226	0.24 uc	2
64	6680-527-6060	Tachometer	Ra 226	15 uc	2
65	6680-956-2598	Tachometer	Ra 226	15 uc	2
66	6680-990-2476	Indicator, Liquid Quantity	Ra 226	0.6 uc	2
67	6680-993-3399	Speedometer	Ra 226		2
68	6685-335-9511	Gage, Fuel	Ra 226		2
69	6685-350-4592	Indicator, Temperature	Ra 226	15 uc	2
70	6685-360-8111	Gage, Pressure, Dial	Ra 226		2
71	6685-514-5327	Indicator, Temperature	Ra 226		2
72	6685-514-5491	Indicator, Temperature	Ra 226	0.7 uc	2
73	6685-514-5493	Indicator, Temperature	Ra 226	1 uc	2
74	6685-526-7036	Indicator, Thermometer	Ra 226	0.8 uc	2
75	6685-526-7734	Indicator, Temperature	Ra 226		2
76	6685-527-6766	Indicator, Thermometer	Ra 226		2
77	6685-557-5928	Gage, Pressure	Ra 226		2
78	6685-580-3882	Indicator, Temperature	Ra 226	15 uc	2
79	6685-772-8855	Indicator, Temperature	Ra 226	15 uc	2
80	6685-814-4772	Indicator, Temperature	Ra 226	15 uc	2

APPENDIX C

END ITEMS USING RADIOACTIVE PARTS

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1450-731-8189	Power Station, Guided Missile Syst.	71
1905-153-6695	Landing Craft, Mechanized, LCM-6	74
1905-217-2293	Landing Craft, Utility, LCU-1466	22, 74
1905-267-1097	Landing Craft, Mechanized, LCM-8	34
1925-216-1845	Tug, Ocean Going, Diesel	74
1925-375-3002	Tug Harbor, Diesel	62
1930-373-2981	Lighter, Amphibious, LARC LX	16, 31
1930-710-5728	Lighter, Amphibious, LARC V	28, 77, 78
1940-267-1100	Boat, Utility, Diesel	7
1930-710-5728	Lighter, Amphibious, LARC V	28, 77, 78
1940-915-0079	Boat, Bridge Erection	25
2320-835-8322	Truck Cargo	79
2410-837-4224	Tractor, Caterpillar	80
2410-843-6374	Tractor, Caterpillar	80
2420-973-0019	Tractor, Wheeled	80
3210-790-2174	Sawmill, Circular, Semi-Trailer Mounted	80
3431-072-0327	Welding Machine, Arc	80
3431-810-9696	Welding Machine, Arc	80
3805-050-4638	Ditching Machine	59, 61
3810-815-2308	Crane, Shovel, 7 Ton	72
3895-849-2116	Distributor Bituminous	21
3930-554-2700	Truck, Lift, Fork, Rough Terrain	72
3930-679-4458	Truck, Lift, Fork, Rough Terrain	72
3930-799-9956	Truck, Lift, Fork, Rough Terrain	72
3930-950-9985	Truck, Lift, Fork	73
3930-973-0659	Truck, Lift, Fork	66, 73
4210-620-3140	Truck, Firefighting, Pumper	58, 68
4220-912-9092	Diving Equipment Set	1, 2
4310-542-2526	Compressor, Wheel Mounted	23, 27
5420-010-5191	Mobile Floating Assault Bridge	67
6115-075-1641	Generator Set, 3KW	20
6115-679-5580	Generator Set, 3 KW	32
6115-730-5911	Generator Set, 1-5 KW	35
6115-771-8107	Generator Set, 0.5 KW	33
6350-937-1487	Alarm System	4
6665-223-7293	Detecting Set, Mine	30
6675-641-3603	Survey Set, Triangular	18

* Index Numbers in Appendix C relate to Index Numbers in Appendix B.

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By Order of the Secretary of the Army:

W. C. WESTMORELAND,
General, United States Army,
Chief of Staff.

Official:

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Major General, United States Army,
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